PT SOCFIN INDONESIA
Medan

(SOCFINDO)

Aek Loba Timur Genetic Block

Overview and summary of results

J.Ch. Jacquemard, January 2009

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Results summary

Climatic environment

Since 1995, first planting date, the project suffered from four droughts: 1997 – 1998, 2002 – 2003, 2005 – 2006 and another started last year (2008 - ?). The three first are well correlated with El Niño events. The current situation, with around 200 mm of water deficit, appearing during La Niña event, is totally out of range for more than 20 years.

In that respect, water deficit constraints received by ALT project is summarized as follow:

Table 1: Average Water deficit (mm / year)

Planting year	Immature period	FFB 3 – 5 years old	FFB 6 – 9 years old
1995	101	61	21
1997 I	101	71	53
1997 II	97	84	53
1998	0	25	46
1999	17	25	50
2000	42	62	80[1]

General results

Average crop per year of planting is reported in table 2. 1995 and 1997 I plantings are without doubt the best planting years. Correlation with water deficit seems explain partially these results ($WD_{3-5} – FFB_{3-5} = -0.5$; $WD_{6-9} – FFB_{6-9} = 0.79$).

Table 2: Average crop at young and full mature period

Year of planting	OER (%)	FFB (t/ha)		CPO (t/ha)	
		3 – 5 yrs old	6 – 9 yrs old	3 – 5 yrs old	6 – 9 yrs old
1995	26.8	21.0	33.9	5.628	9.085
1997 I	26.7	23.6	29.1	6.301	7.769
1997 II	26.3	19.5	27.5	5,129	7.233
1998	25.8	21.3	28.4	5.495	7.327
1999	24.1[2]	24.6	31.5	5.929	7.592[3]
2000	25.9	21.4	27.6	5.543	7.148[4]
Mean	25.9	21.9	29.7	5.671	7.692

[1] Estimation based on 6 – 8 yrs old period
[2] Lower extraction due to (Deli * Angola) second cycle
[3] Data 6 – 8 years old
[4] Data 5 – 7 years old

In 1995 planting, ALGP 04 testing (DA10D * DA115) * LA ME materials is the best. Top 3 produces 9.690 t CPO / ha with 27.4 % OER.

In 1997 I planting, ALGP 09 testing DA115D selfed * LA ME materials is on the top. Three best progenies reach 8.935 t CPO / ha with 29.2 % OER.

In 1997 II planting, that is ALGP 13 that is the best. It is evaluating (DA3D, DA10D and DA115D combination) * LA ME. Top 3 rises 8.952 t CPO / ha with 28.5 % OER. This top 3 includes DA115D selfed * LA ME materials only.

For 1998 planting, ALGP 21, testing various combinations (DA10D, DA115D and LM269D) * LA ME, is the best. Its CPO / ha reaches 8.613 tons with 27.8 % OER.

In 1999, because specific characteristics of tested (Deli * Angola) * LA ME crosses, only ALGP 23 could be taken in consideration here. This trial evaluates various Deli Socfindo * Nifor or Yangambi B group parents. Top 3 crop is arising 7.967 t CPO / ha with only 25.8 % OER.

At least, in 2000 planting, the best trial is ALGP 26, testing various Deli * LA ME from Pobé. Top 3 goes to 8.195 tons CPO / ha with 27.4 % OER.

General Combining Ability

A group

From Socfindo Deli, 6 parents present passable GCA, improving their families by 3% in average to 7.670 t CPO / ha from 7.450 t CPO / ha. The best one is BB2141D (BB126D * BB150D) with a potential of 7.860 t CPO and 27.9 % OER.

From Socfindo B group parents, 10 genitors present good GCA improving their respective families by 5.6% in average to 8.140 t CPO / ha and 26.6 % OER. The best one is BB5211T with 8.550 t CPO / ha and 28.3 % OER. But, coming from Nifor origin, its height increment is 55% more than an equivalent LA ME parent.

From Pobé Deli tested with LA ME origin, 18 parents present great interest, improving by 4.6% their respective families with 8.030 t CPO / ha and 27% OER. The best one is PO3600D from LM404D selfed with 8.700 t CPO / ha and 29% OER as potential.

From Pobé Deli tested with Yangambi origin, 6 parents are recorded with good GCA improving their respective families by 5.4% with 8.030 t CPO / ha and 26.6 % as OER. The best one is PO4953D from DA551D * DA767D with respectively 8.200 t CPO / ha and 25.3 % OER.

B group

Evaluation of LA ME origin needs to take in account legitimacy of some parents. 29 parents are distinguished for their good GCA. 3 out of them are illegitimate: PO3636P, PO4234T and PO4100P. PO4743P gives off-type progenies. Nevertheless, in average, these 29 genitors improve their families by 6.1 % with

8.130 t CPO / ha and 27.0% OER. The best one is without doubt PO4982P (LM5T * LM10T) with a promising 9.040 t CPO / ha and 29 % OER.

At least, only 2 parents are emerging from tested Yangambi parents: PO4257T and PO4260P improving (LM238T * LM511P) family by 5 % at 8.020 t CPO / ha and 27.8 % OER.

AEK LOBA TIMUR BREEDING BLOCK PRESENTATION

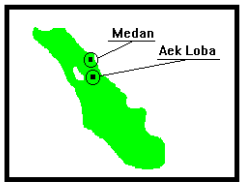
AIM OF THE BLOK

- Follow-on of the Socfindo' breeding Research & Development Program
- Improving the quality of the Socfindo oil palm planting material (particularly yields and Ganoderma tolerance)
- Natural follow-on from the Aek Kwasan genetic Block.
- Set-up an oil palm genetic block connected to the multiple-site CIRAD network.

The technical assistance provided by Cirad is covering this R&D program, fully integrated in the Recurrent Reciprocal Scheme, through the Socfindo – Cirad Oil Palm Agreement.

THE ESTATE

Location :



North Sumatra - Indonesia
Aek Loba Estate in Division I and II
212 km on the Medan - Pekan Baru Road in Asahan

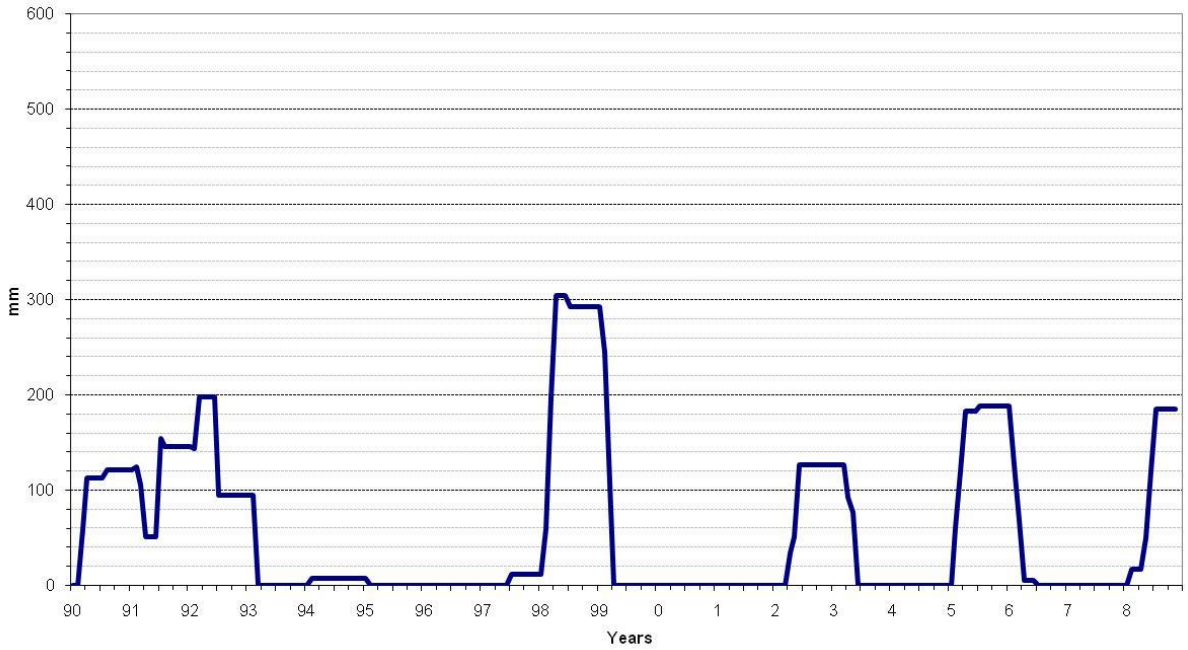
Description of the estate (01/01/2009):

Rejuvenation 2009	211.50
Immature planting	773.99
Mature planting	7811.18
Other Area	112.84
Total	8909.51

Climate

Figure 1: Rainfall (12 last months sum)

Figure 2: Water deficit (12 last months sum)



Annual data	Mean	Min	Max
Rainfall (mm)	2280 ± 224	1697 (2005)	3044 (1999)
Rainy days (number)	127 ± 11	88 (1997)	149 (2006)
Water Deficit (mm)	55 ± 54	0 (9 years)	292 (1998)

(1990 – 2008 data)

Agronomy:

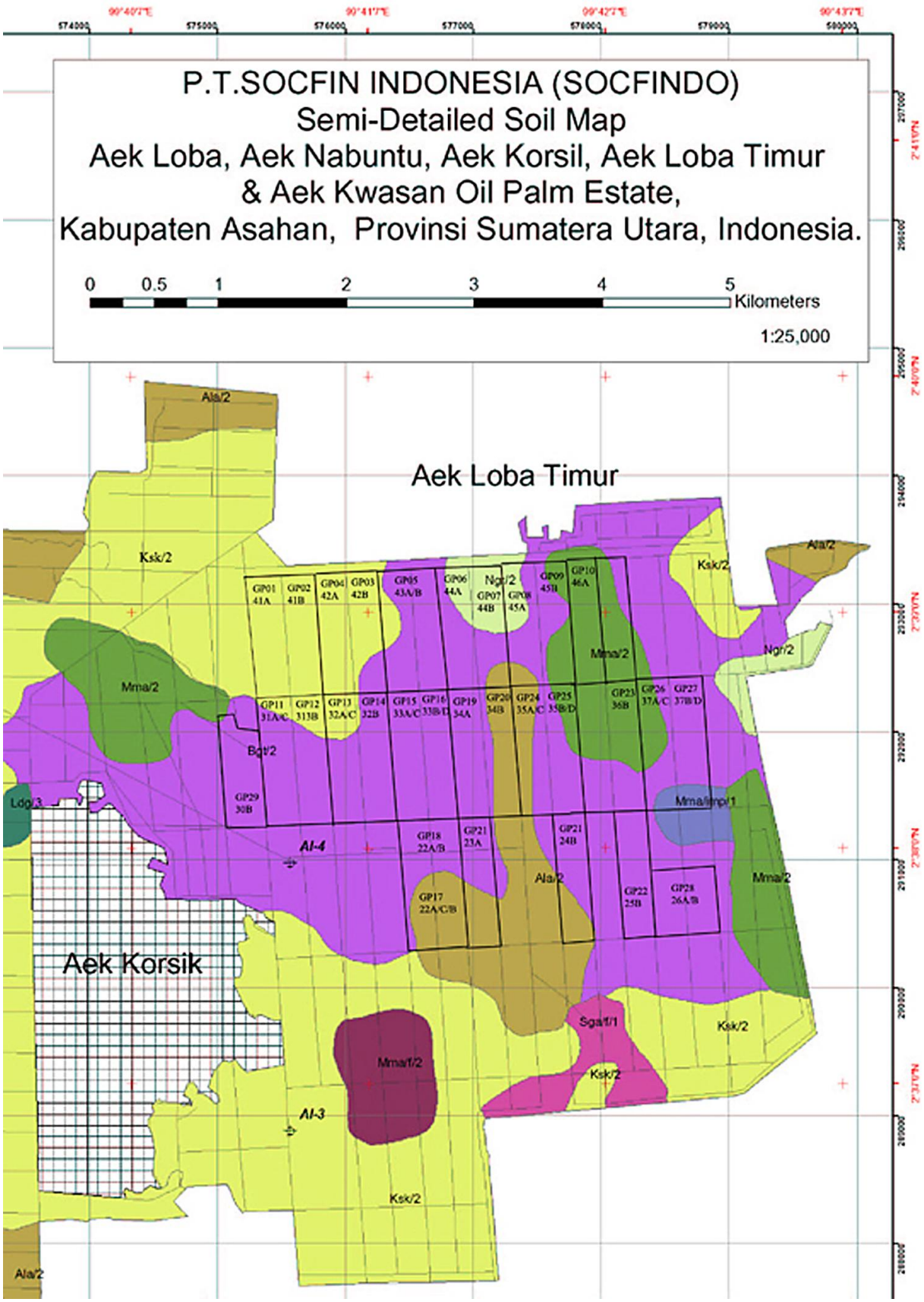
Second generation of oil palm

Soil Survey[5]:

Symbol	Soil map unit	Slope class	Brief description
Ala/2	Aek Loba	Undulating	Deep (>100cm), well drained yellowish red coarse sandy clay loam to coarse sandy clay. Weak to moderate medium sub angular blocky; friable; thin patchy clay skins. Many volcanic glass shards. Soils developed over Toba Tuffs.
Bgt/2	Bargot	Undulating	Deep (>100cm), well drained brownish yellow to yellow coarse sandy clay loam. Weak to moderate medium and fine sub angular blocky; friable; thin patchy clay skins. Few volcanic glass shards. Soils developed over Toba Tuffs.
Ksk/2	Korsik	Undulating	Deep (>100cm), well drained yellow to brownish yellow fine sandy clay loam. Weak to moderate medium sub angular blocky; friable; thin patchy clay skins. Few volcanic glass shards. Soils developed over Toba Tuffs.
Ngr/2	Nanggar	Undulating	Deep (>100cm), well drained fine and coarse sandy clay. Moderate medium sub angular blocky; friable; patchy clay skins. Some glass shards. Soils developed over Toba Tuffs.
Mma/2	Membang muda	Undulating	Deep (>100cm), well to somewhat excessively drained yellow coarse to fine sandy loam. Light grey colours below 50 cm deep. Weak medium to fine sub angular blocky; friable; no clay skins. Some volcanic glass shards. Soils developed over Toba Tuffs.

Soil Management Group	Soil map unit	Requirement	Trials
A	Ngr/2	Good fertiliser programme. Monitoring micronutrients.	GP06 (part), GP07 (part), GP08 (part)
B	Ala/2 Bgt/2 Ksk/2	Good fertiliser programme with emphasis on P. Monitoring micronutrients.	GP01 to GP05, GP06 to GP09 (part), GP11 to GP22, GP23 (part), GP24, GP25 (part), GP26 to GP28
C	Mma/2	Mulching with EFB. Good fertiliser programme with emphasis on P and K.	GP09 (part), GP10, GP25 (part), GP23 (part)

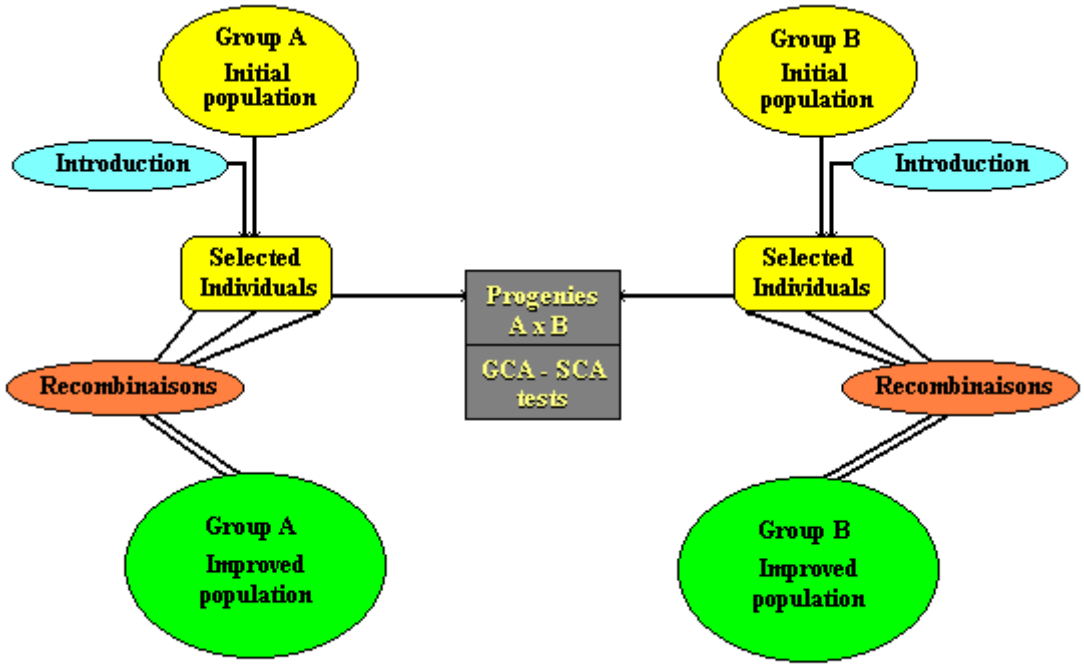
[5] From Soils of Aek Loba, Param Agricultural Soil Surveys (M) SDN. BHD. 2004.


P.T.SOCFIN INDONESIA (SOCFINDO)
Semi-Detailed Soil Map
Aek Loba, Aek Nabuntu, Aek Korsil, Aek Loba Timur
& Aek Kwasan Oil Palm Estate,
Kabupaten Asahan, Provinsi Sumatera Utara, Indonesia.
0 0.5 1 2 3 4 5
Kilometers
1:25,000
Aek Loba Timur
Aek Korsik
Ala/2
Ksk/2
Mma/2
Ngr/2
Bqt/2
Ldg/3
Mma/Imp/1
Sga/f/1
Mma/f/2
AI-4
AI-3

The genetic block

Program:

- Second cycle Tests of progenies from material either imported from SRPH Pobé (Benin - Africa) or produced by PSBB Socfindo (25 trials).
- Tests of clones produced by PSBB Socfindo (3 trials).



CIRAD Breeding Network:

SOCFINDO Aek Loba (Sumatra - Indonesia)
SRPH Pobé (Bénin - Africa)
CNRA La Mé (Côte d'Ivoire - Africa)
IRA La Dibamba (Cameroun - Africa)
Rio Urubu (Brazil - South-America)
CIRAD Montpellier (France - Europe)

Surfaces:

Year	In Trial	Outside	Total
1995	67.13	30.92	98.05
1997	141.26	58.80	200.06
1998	45.19	16.52	61.71
1999	34.13	24.20	58.33
2000	37.77	32.94	70.71
Total	325.48	163.38	488.86

Grand-parental Origin of tested materials:

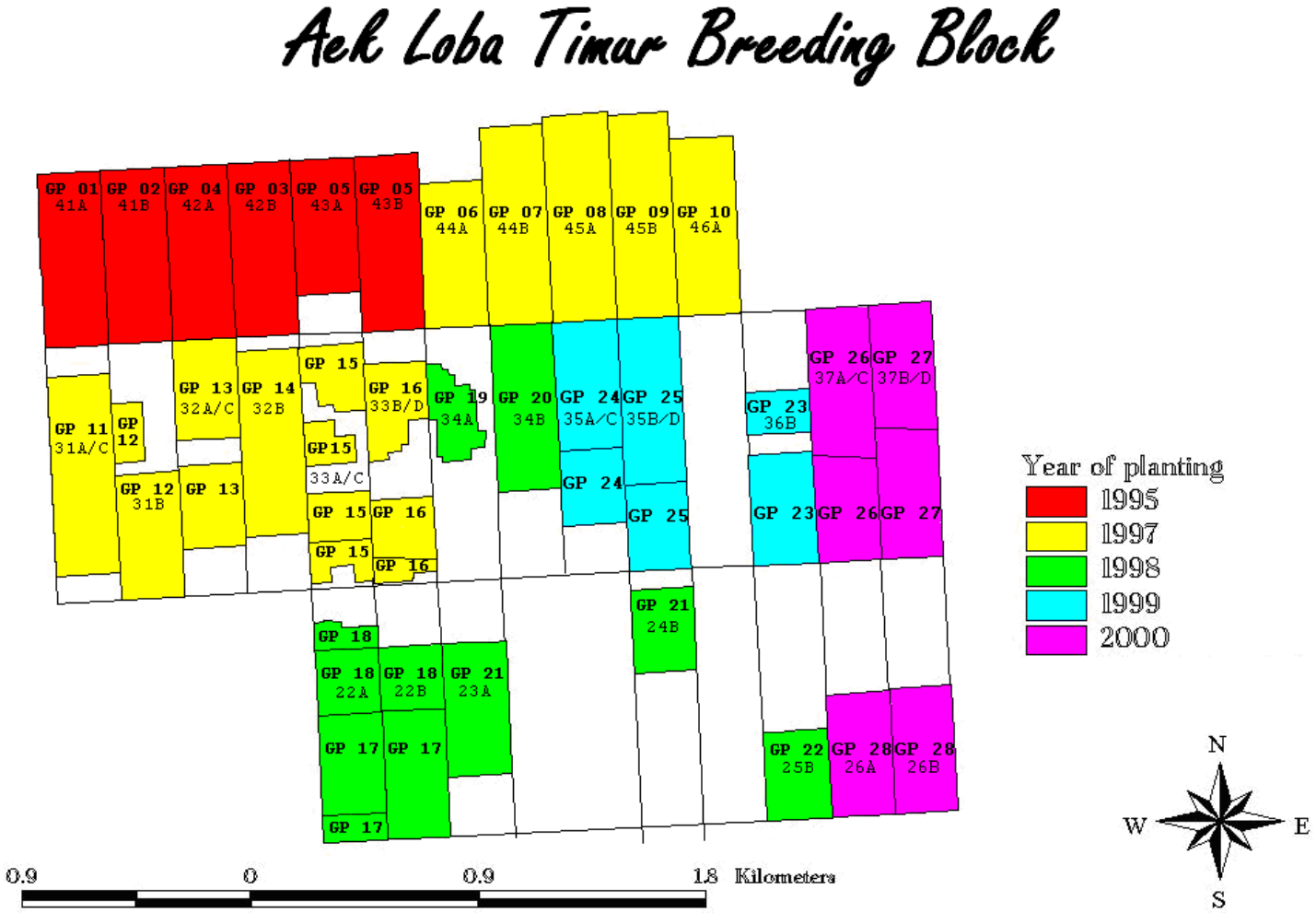
A Group:

Deli Socfindo:	BB126D, BB127D, BB129D, BB150D, BB177D, BB206D
Deli Dabou (CI):	DA3D, DA5D, DA10D, DA115D, DA128D, DA300D, DA551D, DA767D.
Deli Socfin (Malaysia):	LM269D, LM404D.
Deli Socfin x Angola:	LM5448T

B Group:

Bangun Bandar:	BB20P, BB85T.
Côte d'Ivoire:	LM2T, LM5T, LM9T, LM10T, LM13T, LM311P.
Nigeria:	PO1876T, PO1879T.
YaSi:	LM238T, LM718T, SI10T.

Layout in the field



Characteristics of the trials:

Group 1: Tests of genitors from Pobé

Trial	Number of treatments	Design	Planting Date	Block	Progeny types
AL GP 01	25	Lattice 5x5	10/1995	41A	(DA5D x DA3D) x La Mé
AL GP 02	25	Lattice 5x5	10/1995	41B	(LM269D x DA128D) x Yangambi
AL GP 03	25	Lattice 5x5	11/1995	42B	(DA115D x DA3D) x La Mé
AL GP 04	25	Lattice 5x5	11/1995	42A	(DA10D x DA115D) x La Mé
AL GP 06	16	Lattice 4x4	04/1997	44A	(DA551D x DA767D) or (LM269D x DA128D) x (LM238T x LM511P) or (LM718T x LM238T)
AL GP 07	25	Lattice 5x5	04/1997	44B	LM404D, DA3D, DA10D, DA115D recombination x La Mé
AL GP 08	25	Lattice 5x5	04/1997	45A/C	(DA10D x DA3D) x La Mé
AL GP 09	25	Lattice 5x5	04/1997	45B/D	(DA115D self) x La Mé
AL GP 10	16	Lattice 4x4	04/1997	46A	(LM269D x DA115D) x La Mé
AL GP 11	25	Lattice 5x5	10/1997	31A/C	(DA300D x DA128D) x La Mé
AL GP 12	20	Fisher R6	10/1997	31B	LM269D, DA3D, DA5D, DA10D and DA115D recombination x La Mé
AL GP 13	25	Lattice 5x5	10/1997	32A/C	DA3D, DA10D and DA115D recombination x La Mé
AL GP 14	25	Lattice 5x5	10/1997	32B	LM404D, DA3D and DA10D recombination x La Mé
AL GP 20	25	Lattice 5x5	10/1998	34B	DA3D, DA5D, DA10D and DA115D recombination x La Mé
AL GP 21	25	Lattice 5x5	11/1998	23A 24B	LM269D, DA10D and DA115D recombination x La Mé
AL GP 26	25	Lattice 5x5	04/2000	37A/C	DA3D, DA5D, DA10D and DA115D recombination x La Mé
AL GP 27	25	Lattice 5x5	05/2000	37B/D	(DA115D self) x La Mé
AL GP 28	25	Lattice 5x5	05/2000	26A/B	DA10D, DA115D, DA128D, DA300D, LM404D recombination x La Mé

Group 2: Tests of genitors from Bangun Bandar

Trial	Number of treatments	Design	Planting Date	Block	Progeny types
AL GP 15	25	Lattice 5x5	11/1997	33A/C	(LM269D x DA128D) or (BB126D x BB150D) x Yangambi
AL GP 16	25	Lattice 5x5	11/1997	33B/D	(BB126D x BB150D) x BB85Tself or (BB85T x BB20P)
AL GP 17	25	Lattice 5x5	11/1997	22A/C/B	(BB126D x BB150D), (BB177D x BB129D) or BB206D self x La Mé or Yangambi
AL GP 18	18	Fisher R6	05/1998	22A/B	(BB126D x BB150D), (BB177D x BB129D) or BB206D self x Nifor
AL GP 23	16	Lattice 4x4	02/1999	36B	(BB126D x BB150D), (BB177D x BB129D) or BB206D self x Nifor or Yangambi
AL GP 24	25	Lattice 5x5	03/1999	35A/C	(Deli x Angola) Second cycle x La Mé
AL GP 25	25	Lattice 5x5	03/1999	35B/D	(Deli x Angola) Second cycle x La Mé

Group 3: Tests of clones coming from Aek Kwasan genetic block

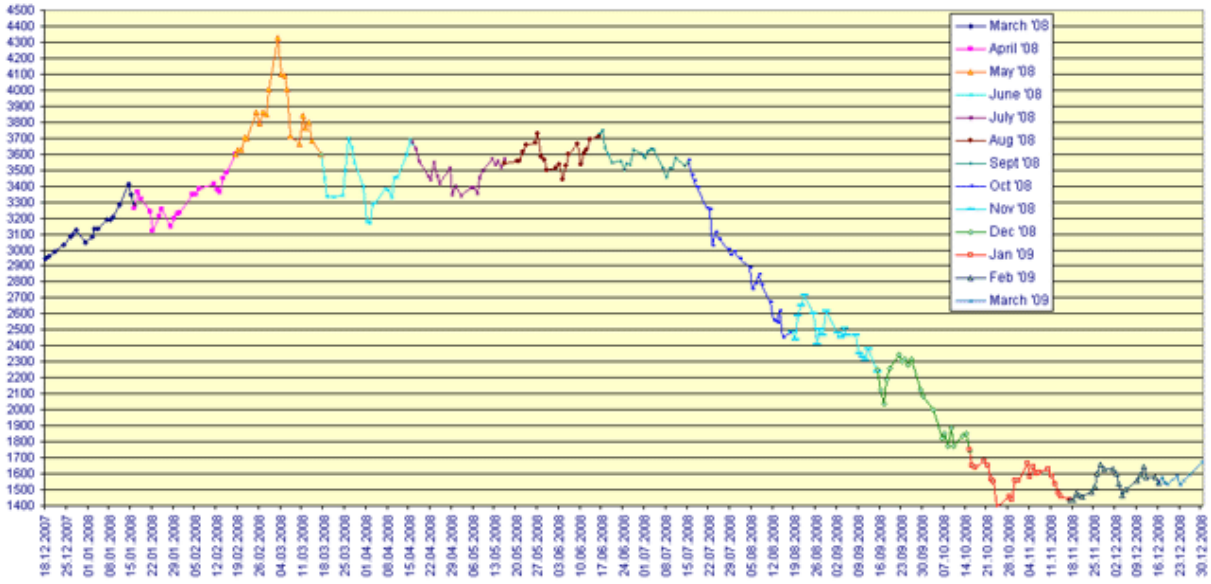
Trial	Number of treatments	Design	Planting Date	Block	Progeny types
AL GP 05	25	Lattice 5x5	11/1995	43A/B	Clones PSBB
AL GP 19	12	Fisher R6	06/1998	34A	Clones PSBB
AL GP 22	17	Fisher R6	11/1998	25B	Clones PSBB

Trials results

Note:
Updated with 2007 campaign data
FFB (t/ha) = average crop per tree (kg / year) *135/1000
BN = bunch number per tree (n / year)
ABW = FFB / BN (kg)
Palm oil (t/ha) = Palm oil crop (FFB*OER/100)
OER (%) = O/B*0.855
PKOR (%) = K/B*0.5*0.893

For all the trials, OER and PKR are susceptible to be adjusted according the latest available data.

CPO = USD 505 Bursa KL 2009/01
PKO = USD 515 Bursa KL 2009/01



Standard observations:

Standard observations realised on genetic trials (AL)
Updated 2009

Census (abnormalities, damages, etc.)	
Monthly	N0 - N1
4 times a year	N2 - N3
2 times a year	Ganoderma
Once a year	Tree file
Leaf analysis (+ rachis in 2009)	
Per progeny at 3, 5, 7 and 9 years old	
Global analysis at 4, 6 and 8 years old	
After 9 year old, per progeny every 3 years	
Individual recording	
From 3 to 15 years old except specific cases	
Bunch analysis	
At 5 - 6 years old	
oil composition	
Iodine value	
Vertical growth at adult stage	
6, 9 ,12 and 15 years old	
Vegetative characteristics	
Projected canopy at 9 years old	
Leaf area at 10 years old	
Male flowering census	(Started in 2002 for ALT)
Weekly: 3 to 9 years old	
Monthly for 10 years old and after	

The Top in extraction rate at Aek Loba Timur Breeding Block

P Group A	P Group B	Code	OER (%)	PKOER (%)	Total Oil (%)	GP Group A	GP Group B
BB 2137 D	BB 121 P	23/12	29.7	2.6	32.3	BB126DXBB150D	LM718TxLM238T
BB 2150 D	BB 97 T	17/06	29.3	2.0	31.3	BB126DxBB150D	LM718TxLM238T
PO 2816 D	PO 2981 P	04/15	29.3	2.4	31.7	DA10DxDA115D	LM2TxLM5T
PO 2893 D	PO 4991 T	13/03	29.2	1.3	30.5	DA10DxDA115D	LM5TxLM10T
PO 2631 D	PO 4989 T	08/05	29.8	1.8	31.6	DA10DxDA3D	LM5TxLM10T
PO 4907 D	PO 4102 P	27/18	29.7	2.5	32.2	DA115D II	LM2Tselfed
PO 3174 D	PO 4740 P	28/06	29.0	1.7	30.7	DA115Dselfed	(LM2TxSI10T)I
PO 3075 D	PO 2766 P	08/19	30.2	1.5	31.7	DA115Dselfed	LM10Tselfed
PO 3174 D	PO 2766 P	09/15	29.6	1.2	30.8	DA115Dselfed	LM10Tselfed
PO 3066 D	PO 2557 P	09/04	29.5	1.9	31.4	DA115Dselfed	LM2Tselfed
PO 3064 D	PO 4973 T	09/20	29.3	1.6	30.9	DA115Dselfed	LM5Tselfed
PO 3066 D	PO 4974 T	09/21	29.0	1.7	30.7	DA115Dselfed	LM5Tselfed
PO 3170 D	PO 2973 P	09/07	29.2	1.8	31.0	DA115Dselfed	LM5TxLM10T
PO 3174 D	PO 2973 P	09/08	29.4	1.3	30.7	DA115Dselfed	LM5TxLM10T
PO 3360 D	PO 4982 P	13/12	29.3	1.2	30.5	DA115Dselfed	LM5TxLM10T
PO 2988 D	PO 2762 P	03/09	29.7	2.0	31.7	DA115DxDA3D	LM2TxLM10T
PO 3367 D	PO 4973 T	03/19	29.3	1.4	30.7	DA115DxDA3D	LM5Tselfed
PO 4950 D	PO 4259 T	06/05	30.7	2.7	33.4	DA551DxDA767D	LM238TxLM511P
PO 2852 D	PO 4749 P	10/14	29.4	1.9	31.3	LM269DxDA115D	LM5Tselfed
PO 2704 D	PO 4799 P	10/13	29.0	2.0	31.0	LM269DxDA115D	LM5Tselfed
PO 3052 D	PO 4982 P	28/12	29.0	1.7	30.7	LM269DxDA115D	LM5TxLM10T
PO 4265 D	PO 4260 P	02/07	30.3	2.3	32.6	LM269DxDA128D	LM238TxLM511P
PO 4276 D	PO 3243 P	02/13	29.8	2.9	32.7	LM269DxDA128D	LM718TxLM238T
PO 4279 D	PO 3237 T	02/08	29.0	2.7	31.7	LM269DxDA128D	LM718TxLM238T
PO 3600 D	PO 2762 P	14/05	29.6	1.6	31.2	LM404Dselfed	LM2TxLM10T
PO 3600 D	PO 4238 P	28/20	29.0	1.4	30.4	LM404Dselfed	LM2TxLM5T
PO 3600 D	PO 4799 P	28/21	31.6	1.8	33.4	LM404Dselfed	LM5Tselfed
PO 3413 D	PO 2973 P	14/01	29.2	1.4	30.6	LM404Dselfed	LM5TxLM10T
PO 3600 D	PO 3243 P	28/22	30.3	2.4	32.7	LM404Dselfed	LM718TxLM238T

Summary of GCA calculated on Aek Loba Timur Breeding Block

Note : derived from T Durand – Gasselin, B Nouy and A Flory document. Best genitors only are quoted with the mean of the corresponding family. GCA should be reevaluated with 2008 campaign data.

GCA - PSBB A Group

Parent		Origin	OER (%)	CPO 3_5 (t/ha)	BN 6_9 (nb/tree)	FFB 6_9 (kg/tree)	ABW 6_9 (kg)	CPO 6_9 (t/ha)	H 6_9 (cm/yr)
BB 2141 D	++	BB 126 D x BB 150 D	27,9	6,02	15,2	207,5	14,4	7,86	68,4
BB 5193 D	+	BB 126 D x BB 150 D	26,3	5,70	15,9	214,4	14,2	7,76	63,6
BB 5195 D	+	BB 126 D x BB 150 D	25,6	5,68	16,1	221,4	14,5	7,75	60,8
		Mean (BB 126 D x BB 150 D)	26,6	5,77	15,7	209,2	14,0	7,62	63,8
BB 3987 D	+	BB 177 D x BB 129 D	26,5	6,21	17,6	220,6	13,4	7,64	67,2
		Mean (BB 177 D x BB 129 D)	25,9	5,86	16,9	213,6	13,3	7,46	66,7
BB 2855 D	0/+	BB 206 D AF	26,1	5,87	15,3	210,8	14,7	7,56	63,4
BB 2868 D	0/+	BB 206 D AF	26,9	6,10	14,6	202,4	14,4	7,45	62,4
		Mean (BB 206 D Selfed)	26,0	5,73	15,2	205,7	14,3	7,29	61,3

GCA - PSBB B Group

Parent		Origin	OER (%)	CPO 3_5 (t/ha)	BN 6_9 (nb/tree)	FFB 6_9 (kg/tree)	ABW 6_9 (kg)	CPO 6_9 (t/ha)	H 6_9 (cm/yr)
		Mean (BB 85 T Selfed)	26,7	5,64	13,6	190,7	14,7	7,03	68,7
		Mean (BB 85 T x BB 20 P)	25,7	5,50	14,0	191,5	14,2	6,76	64,1
BB 270 P	++	LM 2 T AF	24,6	5,93	20,4	251,2	12,6	8,26	53,8
BB 105 T	0/+	LM 2 T AF	25,2	5,56	18,5	226,1	12,7	7,93	53,2
		Mean LM 2 T self	25,3	5,67	17,6	222,8	13,4	7,68	57,0
BB 111 T	0/+	LM 2 T x LM 5 T	25,7	5,68	20,0	229,2	11,8	8,07	51,9
		Mean (LM 2 T x LM 5 T)	24,5	5,34	18,5	217,6	12,1	7,38	53,6
BB 96 T	+	LM 718 T x LM 238 T	27,1	6,30	15,4	216,9	14,8	7,99	64,5
BB 94 T	0/+	LM 718 T x LM 238 T	26,8	6,04	16,2	224,9	14,6	7,97	57,6
BB 97 T	+	LM 718 T x LM 238 T	28,1	6,43	14,9	210,2	14,8	7,96	59,7
		Mean (LM 718 T x LM 238 T)	27,4	6,09	14,5	205,7	15,0	7,64	60,1
BB 5211 T	++	PO 1879 T x PO 1876 T	28,3	6,17	16,6	220,3	14,0	8,55	83,9
BB 5210 T	++	PO 1879 T x PO 1876 T	26,0	6,38	19,6	238,8	12,4	8,41	67,7
BB 5209 T	++	PO 1879 T x PO 1876 T	27,7	6,13	16,7	220,5	14,0	8,29	73,6
BB 227 P	0/+	PO 1879 T x PO 1876 T	26,4	5,98	18,5	232,0	13,2	7,97	68,4
		Mean (PO 1879 T x PO 1876 T)	26,9	6,09	17,4	224,6	13,5	8,14	73,2

CGA - Pobe A group tested with LM

Parent		Origin	OER (%)	CPO 3_5 (t/ha)	BN 6_9 (nb/tree)	FFB 6_9 (kg/tree)	ABW 6_9 (kg)	CPO 6_9 (t/ha)	H 6_9 (cm/yr)
PO 2799 D	++	DA 10 D x DA 115 D	25,9	5,74	19,4	234,2	12,4	8,27	57,8
		Mean (DA 10 D x DA 115 D)	25,9	5,58	18,8	223,4	12,3	7,85	54,2
		Mean (DA 10 D x DA 3 D)	25,6	5,17	18,5	216,4	12,4	7,52	51,9
PO 3174 D	++	DA 115 D AF	27,2	6,14	18,1	221,8	12,9	8,18	52,2
PO 3360 D	+	DA 115 D AF	26,5	5,98	18,1	218,3	12,8	7,95	55,2
		Mean (DA 115 D AF)	26,5	5,82	16,8	212,0	13,3	7,70	51,2
PO 3367 D	0/+	DA 115 D x DA 3 D	27,0	5,89	17,0	207,7	12,8	7,63	47,1
PO 2988 D	0/+	DA 115 D x DA 3 D	28,1	5,87	16,2	198,0	12,9	7,61	49,4
		Mean (DA 115 D x DA 3 D)	26,3	5,73	16,7	208,2	13,1	7,44	46,7
PO 4463 D	0/+	DA 300 D x DA 128 D	27,2	5,51	18,4	216,1	12,4	7,97	54,3
PO 4837 D	0/+	DA 300 D x DA 128 D	27,3	5,52	18,8	214,8	12,1	7,93	53,9
PO 4840 D	0/+	DA 300 D x DA 128 D	27,2	5,77	18,3	214,1	12,4	7,88	55,4
		Mean (DA 300 D x DA 128 D)	26,6	5,33	17,7	207,5	12,4	7,52	53,9
PO 3699 D	++	DA5D x DA3D LM 3038 D	27,0	6,19	17,7	219,8	12,9	8,21	48,8
PO 4007 D	0/+	DA5D x DA3D LM 3038 D	23,5	5,01	21,9	250,3	11,5	8,03	60,5
PO 3969 D	0/+	DA5D x DA3D LM 3033 D	25,8	5,83	19,6	225,7	11,2	7,82	47,7
		Mean (DA5D x DA3D)	25,0	5,54	18,8	223,3	12,0	7,49	49,9
PO 2704 D	+	LM 269 D x DA 115 D	27,3	6,16	16,6	210,5	13,4	7,87	56,5
		Mean (LM 269 D x DA 115 D)	26,2	5,81	16,2	207,7	13,7	7,38	51,6

PO 3600 D	++	LM 404 D AF	29,6	6,20	17,6	217,8	13,1	8,70	56,4
PO 3413 D	+	LM 404 D AF	28,1	5,49	18,4	210,8	12,0	8,13	57,1
PO 3421 D	++	LM 404 D AF	28,3	5,91	18,7	213,7	12,0	8,13	53,0
		Mean (LM 404 D Selfed)	28,5	5,82	18,1	210,0	12,3	8,15	55,5
PO 2580 D	++	LM 404 D x DA 10 D	27,2	5,68	19,9	231,1	12,3	8,51	59,0
PO 3127 D	0/+	LM 404 D x DA 10 D	25,9	5,65	18,3	219,9	12,7	7,82	62,2
		Mean (LM 404 D x DA 10 D)	26,5	5,48	18,8	216,1	12,2	7,83	58,6
PO 1986 D	+	LM 404 D x DA 3 D	27,5	5,91	17,4	211,2	12,8	7,95	51,9
		Mean (LM 404 D x DA 3 D)	27,2	5,65	17,6	208,3	12,5	7,75	52,9

CGA - Pobe A group tested with YA

Parent		Origin	OER (%)	CPO 3_5 (t/ha)	BN 6_9 (nb/tree)	FFB 6_9 (kg/tree)	ABW 6_9 (kg)	CPO 6_9 (t/ha)	H 6_9 (cm/yr)
PO 4953 D	++	DA 551 D x DA 767 D	25,3	5,73	19,5	239,2	12,7	8,20	60,0
PO 4949 D	++	DA 551 D x DA 767 D	26,9	5,76	17,5	220,9	13,5	8,06	52,9
		Mean (DA 551 D x DA 767 D)	25,7	5,32	17,9	223,6	13,2	7,78	54,8
PO 4270 D	++	LM 269 D x DA 128 D	25,6	5,73	18,1	231,0	12,9	8,01	60,7
PO 4279 D	++	LM 269 D x DA 128 D	27,0	5,74	15,4	215,8	14,7	7,98	57,6
PO 4272 D	+	LM 269 D x DA 128 D	28,1	6,22	14,6	205,9	14,8	7,89	63,8
		Mean (LM 269 D x DA 128 D)	26,3	5,59	14,9	208,5	14,8	7,45	59,0
PO 3584 D	+	LM 404 D AF	29,3	6,31	15,5	200,1	13,7	7,95	72,0

CGA - Pobe LM parents

Parent		Origin	OER (%)	CPO 3_5 (t/ha)	BN 6_9 (nb/tree)	FFB 6_9 (kg/tree)	ABW 6_9 (kg)	CPO 6_9 (t/ha)	H 6_9 (cm/yr)
PO 2766 P	++	LM 10 T AF	28,3	6,16	20,1	218,1	11,2	8,44	57,1
PO 3281 T	++	LM 10 T AF	26,7	6,16	18,4	224,3	12,6	8,20	51,6
PO 2768 P	0/+	LM 10 T AF	27,9	6,04	18,3	209,4	12,1	7,98	53,4
PO 2765 P	+	LM 10 T AF	27,1	6,21	19,1	215,7	11,5	7,88	56,4
		Mean (LM 10 T Selfed)	27,2	5,95	18,9	214,0	11,8	7,93	54,0
PO 3636 P	+	LM 13 T AF (IL)	27,6	6,20	17,0	209,9	12,6	7,88	51,8
		Mean (LM 13 T Selfed) IL	26,3	5,53	18,5	219,8	12,5	7,72	58,3
PO 4234 T	0/+	(LM 13 T x LM 9 T) IL	27,3	5,66	18,7	215,4	11,8	8,01	60,1
		Mean (? X LM 9 T)	27,1	5,38	16,9	204,8	12,7	7,56	57,2
LM 2282 P	++	LM 2 T AF	26,0	5,81	17,6	227,4	14,3	8,33	48,9
PO 4699 T	++	LM 2 T AF LM 3387 T	27,1	5,73	19,0	225,3	12,5	8,31	45,7
PO 4963 T	++	LM 2 T AF	26,4	6,83	19,1	233,3	12,7	8,31	56,2
LM 1594 P	++	LM 2 T AF	26,8	5,87	17,4	220,0	14,1	8,25	47,7
LM 2256 P	++	LM 2 T AF	27,6	6,38	17,1	208,5	13,6	8,22	51,9
PO 2556 P	0/+	LM 2 T AF	24,2	5,59	20,4	241,4	12,1	7,95	54,4
		Mean (LM 2 T)	25,3	5,56	18,4	220,6	12,6	7,57	49,1
PO 4100 P	++	YA x	27,2	5,93	15,7	219,7	15,0	8,12	57,0
		Mean YA x	27,6	5,34	13,6	197,0	15,8	7,43	50,9
		Mean YA y	26,9	5,70	17,0	217,9	13,4	7,88	58,8

PO 3270 T	+	LM 2 T x LM 10 T	26,1	5,76	19,0	229,5	12,5	8,16	57,4
PO 2758 P	+	LM 2 T x LM 10 T	26,0	5,73	20,0	228,2	11,7	8,11	56,6
PO 2762 P	+	LM 2 T x LM 10 T	26,9	5,80	19,6	219,3	11,5	8,08	47,0
PO 2966 T	0/+	LM 2 T x LM 10 T	25,8	5,79	18,3	222,2	12,5	7,82	53,4
		Mean (LM 2 T x LM 10 T)	26,1	5,70	18,4	218,2	12,3	7,74	52,0
PO 4976 T	0/+	LM 2 T x LM 5 T	26,2	5,32	18,2	223,6	12,8	7,99	52,4
PO 4979 T	0/+	LM 2 T x LM 5 T	26,1	5,92	18,7	224,5	12,3	7,96	52,2
		Mean (LM 2 T x LM 5 T)	25,4	5,48	18,4	219,0	12,4	7,56	51,6
		Mean (LM 2 T x LM 239 T)	25,1	5,01	15,9	198,7	13,3	6,78	53,4
PO 4743 P	++	LM 2 T x SI 10 T	28,6	6,27	16,4	211,0	13,5	8,35	58,6
		Mean (LM 2 T x SI 10 T)	26,5	5,54	16,3	205,7	13,0	7,46	47,8
PO 4749 P	++	LM 5 T AF	27,7	6,43	18,4	224,5	12,8	8,45	54,1
PO 4747 P	++	LM 5 T AF	26,9	5,89	17,2	227,3	13,6	8,33	56,8
PO 4922 T	++	LM 5 T AF	28,3	6,96	16,6	214,3	13,4	8,27	52,4
PO 4974 T	++	LM 5 T AF	27,3	5,89	20,2	224,8	11,3	8,15	55,1
PO 4923 T	+	LM 5 T AF	26,5	5,99	19,3	225,8	12,1	8,12	53,7
PO 4751 P	0/+	LM 5 T AF	25,6	5,32	20,0	227,0	11,7	7,94	56,0
		Mean (LM 5 T Selfed)	26,9	5,84	17,9	215,9	12,6	7,87	54,0
PO 4982 P	++	LM 5 T x LM 10 T	29,1	6,25	19,1	227,9	12,3	9,04	56,0
PO 4984 P	++	LM 5 T x LM 10 T	27,4	5,98	19,4	220,2	11,9	8,19	52,5
PO 2973 P	+	LM 5 T x LM 10 T	28,4	6,40	16,4	210,4	13,5	8,09	56,2
PO 4991 T	+	LM 5 T x LM 10 T	28,4	6,10	18,7	205,9	11,5	7,92	58,4
PO 4989 T	+	LM 5 T x LM 10 T	28,4	6,38	16,5	201,4	12,5	7,86	59,9
PO 4992 T	+	LM 5 T x LM 10 T	26,5	6,19	19,2	218,2	11,8	7,84	52,7

		Mean (LM 5 T x LM 10 T)	27,3	6,00	18,2	212,2	12,1	7,89	54,6
PO 5001 T	0/+	LM 5 T x LM 311 P	25,0	5,89	18,3	236,5	13,2	8,04	45,9
PO 5000 T	0/+	LM 5 T x LM 311 P	27,6	5,55	17,7	211,0	12,3	7,87	48,4
		Mean (LM 5 T x LM 311 P)	25,5	5,53	18,4	219,0	12,3	7,55	49,8

CGA - Pobe YA parents

Parent		Origin	OER (%)	CPO 3_5 (t/ha)	BN 6_9 (nb/tree)	FFB 6_9 (kg/tree)	ABW 6_9 (kg)	CPO 6_9 (t/ha)	H 6_9 (cm/yr)
PO 4257 T	++	LM 238 T x LM 511 P	27,6	5,83	16,5	215,0	14,3	8,18	54,1
PO 4260 P	+	LM 238 T x LM 511 P	28,3	5,61	15,0	203,7	14,3	7,87	59,2
		Mean (LM 238 T x LM 511 P)	26,8	5,57	15,7	208,9	14,2	7,64	60,2
PO 4157 T		LM 718 T AF							
		Mean (LM 718 T x LM 238 T)	25,9	5,57	15,5	213,5	14,6	7,46	57,4

Summary of Aek Loba Timur Breeding Block results per trial

ALGP 01

Aim

Improvement of (DA5D * DA3D) * La Mé material

Characteristics

- October 1995 – Aek Loba – block 501A – second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 30 blocks, 6 replicates
- Assisted pollination from 4 to 7 yrs old

Realized Observation

Individual recording (3 – 13 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6, 9 and 13 yrs old)
Canopy (9 yrs old)
Leaf area (10 yrs old)
Leaf analysis per progeny (1998, 2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3:

(05) PO4015D*LM2230P ab
(07) PO3699D*PO2980T a
(09) PO3969D*PO2979T ab

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	7.902	8.614
FFB	30.078	32.649
OER	26.2	27.0
PKOR	1.96	1.88

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.947	6.464
FFB	22.697	23.940

From 2004, PO4015D*LM2230P is replacing PO4003D*PO2982P which is in Top 4 with 8.441 tons CPO / ha. The gross revenue of the Top 3 rises USD 4.666 / ha, 11% more than the trial mean.

ALGP 02

Aim

Improvement of (LM269D*DA128D) * Yangambi material

Characteristics

- October 1995 – Aek Loba – Block 501B – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 30 blocks, 6 replicates
- Assisted pollination from 4 to 7 yrs old

Realized observation

Individual recording (3 – 13 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6, 9 and 13 yrs old)
Canopy (9 yrs old)
Leaf area (10 years old)
Leaf analysis per progeny (1998, 2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3

(09) PO4270D*PO3237T a
(17) PO4270D*PO3244D a
(20) PO4279D*PO3243P a

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	7.958	8.857
FFB	29.238	33.156
OER	27.2	27.4
PKOR	2.59	2.50

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.797	6.116
FFB	21.234	22.320

No modification within Top 3. The improvement of OER is poor. Large kernels. The gross revenue of the Top 3 rises USD 4899.7 / ha, 11% more than the trial mean.

ALGP 03

Aim

Improvement of (DA115D * DA3D) * La Mé material

Characteristics

- November 1995 – Aek Loba – block 502B – second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 30 blocks, 6 replicates
- Assisted pollination from 4 to 7 yrs old

Realized observation

Individual recording (3 – 13 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6, 9 and 13 yrs old)
Canopy (9 yrs old)
Lea area (10 yrs old)
Leaf analysis per progeny (1998, 2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3:

(02) PO3367D*PO3281T a
(04) PO3052D*PO3281T ab
(09) PO2988D*PO2762P abc

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	8.647	9.608
FFB	31.909	34.530
OER	27.0	28.4
PKR	1.79	1.88

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.374	6.198
FFB	19.830	21.825

Excellent extraction rate. No modification within the Top 3. The gross revenue of the Top 3 rises USD 4582.5 / ha, 11.4% more than the trial mean. Quite high BSR spread.

ALGP 04

Aim

Improvement of (DA10D * DA115D) * La Mé material

Characteristics

- November 1995 – Aek Loba – block 502A – second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 30 blocks, 6 replicates
- Assisted pollination from 4 to 7 yrs old

Realized observation

Individual recording (3 – 13 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6, 9 and 13 yrs old)
Canopy (9 yrs old)
Leaf area (10 years old)
Leaf analysis per progeny (1998, 2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3:

(01) PO2839D*PO2766P a
(08) PO2834D*PO4100P ab
(20) PO2839D*PO4747P a

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	8.696	9.690
FFB	32.431	35.182
OER	26.7	27.4
PKOR	1.70	1.76

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.469	5.820
FFB	20.406	21.240

The Top 3 at 6 – 9 yrs old is relatively low starter at 3 – 5 yrs old in term of FFB. Very small kernel. The gross revenue of the Top 3 rises USD 5170.9 / ha, 10.6 % more than the trial mean. Best performance in 1995 planting.

ALGP 05

Aim

Test of various clones coming from Aek Kwasan genetic block.

Characteristics

- November 1995 – Aek Loba – block 503A/B – second generation of oil palm
- Clone test
- 5 * 5 balanced lattice, 30 blocks, 6 replicates
- Assisted pollination from 4 to 7 yrs old
- Clones produced at PSBB

Realized observation

Individual recording (3 – 9 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Mantled anomaly recording
Stem height (6, 9 and 13 yrs old)
Canopy (9 yrs old)
Leaf area (10 years old)
Leaf analysis per progeny (1998, 2000, 2002, 2004)

Results summary

Top 3:

(06) SOC2704 (LM3466D*LM2246P) ab
(08) SOC2708 (LM3466D*LM2246P) a
(12) SOC2807 (LM2935D*LM3943T) a

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	8.013	8.756
FFB	30.191	32.103
OER	26.5	27.5
PKOR	1.43	1.42

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	4.980	5.210
FFB	18.720	18.945

These clones do not realise the potential of their own ortets. The gap rises 10 per cent in term of palm oil / ha for the best clones. The 3 best clones return USD 4655.6 / ha as gross revenue.

ALGP 06

Aim

Test of (DA551D*DA767D) or (LM269D*DA128D) by (LM238T* LM511P) or (LM738T*LM238T)

Characteristics

- April 1997 – Aek Loba – Block 504A – Second generation of oil palm
- Second cycle progeny trial
- 4 * 4 balanced lattice, 20 blocks, 5 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy (9 yrs old)
Leaf area (10 yrs old)
Leaf analysis per progeny (2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3:

(04) PO4949D*PO4258T b
(05) PO4950D*PO4259T a
(06) PO4953D*PO4257T a

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	7.781	8.820
FFB	29.202	30.641
OER	26.4	28.5
PKR	2.2	2.4

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	6.447	6.376
FFB	22.828	22.424

This material is a good starter one. But the Top 3 shows a medium performance at young age. Good OER and PKOR. The improvement in term of gross revenue is rising 13 % (USD 557.8 / ha) from USD 4832.8 / ha for the Top 3.

ALGP 07

Aim

Test of LM404D, DA3D, DA10D and DA115D recombination by La Mé

Characteristics

- April 1997 – Aek Loba – Block 504B – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 blocks, 6 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy (9 yrs old)
Leaf area (10 yrs old)
Leaf analysis per progeny (2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3:

(11) PO2099D*PO2765P abc
(19) PO3127D*PO5000T ab
(20) PO2509D*PO4922T a

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.647	8.168
FFB	28.916	29.112
OER	26.2	27.9
PKOR	1.7	1.5

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	6.207	6.768
FFB	23.709	24.285

This Top 3 is quite good starter. The improvement in term of gross revenue is intermediate (+5.8%) with USD 4354.2 / ha for the Top 3.

ALGP 08

Aim

Improvement of (DA10D * DA3) * La Mé material

Characteristics

- April 1997 – Aek Loba – Block 505A/C – Second generation of oil palm
- Second cycle progeny trial
- 5 *5 balanced lattice, 25 blocks, 6 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy (9 yrs old)
Leaf area (10 yrs old)
Leaf analysis per progeny (2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3:

(09) PO2630D*PO2766P bc
(15) PO2542D*PO3351T a
(19) PO3075D*PO2766P b

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.943	8.729
FFB	29.235	30.087
OER	26.8	28.8
PKOR	1.6	1.4

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	6.560	7.210
FFB	24.478	25.034

(DA10D*DA3D) * La Mé is a good starter material. At adult stage, the Top 3 improvement comes for 60% from OER. The Top 3 gross revenue is good with USD 4620.4 / ha (+ 8.5%).

ALGP 09

Aim

Second cycle of DA115D * La Mé

Characteristics

- April 1997 – Aek Loba – Block 505B/D – Second generation of oil palm
- Second cycle progeny trial
- 5 *5 balanced lattice, 25 blocks, 6 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy (9 yrs old)
Leaf area (10 yrs old)
Leaf analysis per progeny (2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3:

(04) PO3066D*PO2765P c
(08) PO3174D*PO2973P b
(15) PO3174D*PO2766P a

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	8.003	8.935
FFB	29.342	30.063
OER	27.0	29.2
PKR	1.8	1.3

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	6.334	7.188
FFB	23.467	24.635

Lower starter than the other deli * La Mé, this material shows excellent potential at 6 – 9 yrs old. The Top 3 produces 19 % more than DA115D * LM2T. 80% of improvement comes from OER. Top 3 gross revenue is rising USD 4717 / ha, 9.5 % more than trial mean. Best performance in April 1997 planting.

ALGP 10

Aim

Second cycle of (LM269D * DA115D) * La Mé

Characteristics

- April 1997 – Aek Loba – Block 506A – Second generation of oil palm
- Second cycle progeny trial
- 4 * 4 balanced lattice, 20 blocks, 5 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy (9 yrs old)
Leaf area (10 yrs old)
Leaf analysis per progeny (2000, 2002, 2004, 2006)
Male flowering since 2002

Results summary

Top 3:

(03) PO2852D*PO4984P a
(14) PO2852D*PO4749P a
(15) PO2933D*PO4922T a

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	7.991	8.647
FFB	29.020	29.781
OER	27.3	28.6
PKR	1.7	1.7

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	6.461	7.402
FFB	23.694	25.917

With USD 4627.4 / ha as gross revenue, the Top 3 is exceeding the trial mean by 7.9%. 60% of improvement comes from OER. Disappointing 9th year, such material seems not able to maintain its promising starting.

ALGP 11

Aim

Improvement of (DA300D * DA128D) * La Mé material

Characteristics

- October 1997 – Aek Loba – Block 509A – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 blocks, 6 replicates
- Assisted pollination from 3 to 7 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(01) PO4463D*PO4963T ab
(04) PO4837D*PO4984P ab
(05) PO4837D*PO4747P a

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	6.789	7.770
FFB	26.247	28.420
OER	25.7	27.3
PKOR	1.8	1.5

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	4.923	5.439
FFB	19.170	19.901

The Top 3 revenue (USD 4146.4 / ha) exceeds by 12.9% the trial mean one. Around 60% of improvement comes from FFB. OER looks a little weak. This trial suffered from heavy *Oryctes* damages from 2004 to 2006.

ALGP 12

Aim

Improvement of LM269D, DA3D, DA5D, DA10D and DA115D recombination with La Mé

Characteristics

- October 1997 – Aek Loba – Block 509B – Second generation of oil palm
- Second cycle progeny trial
- Fisher blocks, 20 treatments, 6 replicates
- Assisted pollination from 3 to 7 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(02) PO4015D*PO4687T[6] ab
(07) PO2544D*PO4992T[7] ab
(20) BB3185D*BB270P[8] a

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	6.976	7.570
FFB	27.490	29.445
OER	25.3	25.6
PKOR	1.9	1.9

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.060	5.377
FFB	19.968	20.955

BB3185D*BB270P confirms high FFB (32.450 t / ha) but poor extraction rate (23.5%) and mediocre total extraction rate (26.0). Despite this fact, its total revenue achieves USD 4298.4. Top 3 revenue (USD 4111) exceeds the trial mean by 8.5%.

[6] (DA5D*DA3D) * (LM2T)II
[7] (DA10D*DA3D) * (LM5T*LM10T)
[8] (BB206D selfed) * (LM2T selfed)

ALGP 13

Aim

Improvement of DA3D, DA10D and DA115D recombination with La Mé

Characteristics

- October 1997 – Aek Loba – Block 510A/C – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 7 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(10) PO3360D*PO4292P b
(11) PO3174D*PO4747P a
(12) PO3360D*PO4982P a

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.747	8.952
FFB	28.694	31.093
OER	26.8	28.5
PKOR	1.8	1.3

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.364	6.111
FFB	20.022	21.450

Top 3 comes from DA115D selfed. PO3360D and PO3174D confirm in this trial their very high potential. With USD 4733.8 / ha as gross revenue, the Top 3 is improving the trial mean by 13.5% (USD 561.5).

ALGP 14

Aim

Improvement of LM404D, DA3D and DA10D recombination with La Mé

Characteristics

- October 1997 – Aek Loba – Block 510B – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 7 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(04) PO3600D*PO4751P a
(05) PO3600D*PO2762P a
(19) PO2980T*PO2580D b

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.461	8.560
FFB	28.834	30.640
OER	27.9	25.7
PKOR	1.4	1.8

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.060	5.420
FFB	19.704	19.449

This material is relatively low starter. The Top 3 compensates its weaker FFB by an excellent OER. The kernel is small. Top 3 gross revenue reaches USD 4537.4/ ha with an improvement of 12.6 % from trial mean.

ALGP 15

Aim

Improvement of (LM269D * DA128D), DA300D * DA128D), BB206D selfed or (BB126D * BB150D) by Yangambi or La Mé

Characteristics

- November 1997 – Aek Loba – Block 511A/C – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Some trees, in replicate 2, treatments 21, 22 and 24 or in replicate 5, treatments 21 and 22 have been planted 6 months later (see detailed protocol)
- Assisted pollination from 3 to 7 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(07) PO4270D*PO4257T[9] abc
(11) PO4284D*PO4257T[5] ab
(15) PO3174D*PO4747P[10] a

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.213	8.324
FFB	27.593	30.322
OER	26.1	27.1
PKOR	2.3	2.1

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.038	5.585
FFB	19.338	20.609

Top 3 CPO is disappointing. Combination between FFB and OER is not optimum. 2/3 of improvement comes from FFB. Top 3 Palm kernel oil represents 7% of total gross revenue (USD 326.4 / ha from USD 4530).

[9] (LM269D*DA128D) * (LM238T*LM511P)
[10] (DA115D selfed * LM5T selfed)

ALGP 16

Aim

Improvement of (BB126D * BB150D) by BB85T selfed or (BB85T * BB20P)

Characteristics

- November 1997 – Aek Loba – Block 511B/D – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Some trees (treatment 22) have been planted 6 months later (see detailed protocol)
- Assisted pollination from 3to 7 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(03) BB2138D*BB5205T	a
(04) BB5206T*BB2141D	abcd
(13) BB5193D*BB5197T	abcde

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	6.991	7.586
FFB	26.166	27.880
OER	26.6	27.2
PKOR	1.7	1.5

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.129	5.295
FFB	19.255	19.440

This trial is poorly discriminating. Around 80% of improvement comes from FFB. Top 3 is low starter. Top 3 gross revenue (USD 4050.6) is the lowest recorded in this year of planting.

ALGP 17

Aim

Improvement of (BB126D * BB150D), (BB177D * BB129D) or BB206D selfed by La Mé or Yangambi

Characteristics

- November 1997 – Aek Loba – Block 619A/B/C – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Some trees (in treatments 07, 08, 22) or some treatments (02, 05, 11, 16 and 18) have been planted 6 months later (see detailed protocol)
- Assisted pollination from 3 to 7 yrs old

Realized observation

Individual recording (3 – 11 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(05) BB2141D*BB111T[11] a
(06) BB2150D*BB97T[8] ab
(10) BB2195D*BB96T[12] ab

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.040	7.750
FFB	27.405	28.375
OER	25.6	27.2
PKOR	2.1	1.8

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	4.895	5.170
FFB	19.144	19.036

Low Top 3 gross revenue (USD 4180.2)

[11] (BB126D*BB150D) * LM2T selfed
[12] (BB126D*BB150D) * (LM718T*LM238T)

ALGP 18

Aim

Improvement of (BB126D * BB150D), (BB177D * BB129D) or BB206D selfed by Nifor

Characteristics

- May 1998 – Aek Loba – Block 619A/B – Second generation of oil palm
- Second cycle progeny trial
- Fisher blocks, 18 treatments, 6 replicates
- Some trees (in treatments 07, 08, 22) or some treatments (02, 05, 11, 16 and 18) have been planted 6 months later (see detailed protocol)
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 10 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(1) BB2137D*BB5211T ab
(2) BB2141D*BB5210T a
(3) BB2150D*BB5209T ab

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.098	8.141
FFB	27.306	29.234
OER	25.9	28.0
PKOR	1.6	1.1

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.984	6.765
FFB	23.120	24.186

Top 3 reaches USD 4273.8 as gross revenue. Good FFB and OER but terrible height growth (1.99m for the trial mean and 2.46m for the Top 3). Palm kernel oil is representing 3.8% only of the gross revenue.

ALGP 19

Aim

Test of various clones coming from Aek Kwasan genetic block.

Characteristics

- June 1998 – Aek Loba – Block 512A – Second generation of oil palm
- Clone test
- Fisher blocks, 12 treatments, 6 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 10 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Commercial leaf analysis only
Male flowering since 2002

Results summary

Top 3:

(02) SOC3801 (LM2536D*LM2448T)[13] ab
(03) SOC3202 (LM2781D*LM2256P)[10] abc
(07) SOC4102 (LM2767D*LM2767P)[14] a

At 6 – 9 yrs old

	Mean	Top 3
Palm oil	7.479	8.310
FFB	29.747	32.000
OER	24.9	25.8
PKOR	1.5	1.2

At 3 – 5 yrs old

	Mean	Top 3
CPO	6.113	6.091
FFB	24.578	23.654

Few clones are very affected by various anomalies. The Top 3 FFB is good, but OER looks poor compared to all the other trials, sexual and clone merged. They are low starter too.

[13] DA115D selfed * LM2T selfed
[14] (DA10D*DA3D) * LM2T selfed

ALGP 20

Aim

Improvement of DA3D, DA5D, DA10D and DA115D recombination with La Mé

Characteristics

- October 1998 – Aek Loba – Block 512B – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 10 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002)

Results summary

Top 3:

(01) PO4906D*PO4100P b
(06) PO4887D*PO4100P bc
(21) PO2799D*PO2768P a

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.497	8.395
FFB	29.522	30.934
OER	25.2	26.8
PKOR	1.8	1.5

At 3 – 5 yrs old

	Mean	Top 3
CPO	5.168	5.746
FFB	20.531	21.416

This trial is low starter. PO4100P, which is not LM2T deriving, is confirming its value. 60% of Top 3 improvement comes from OER. With USD 4481.7 as gross revenue, Top 3 improves trial mean by 10.2 %.

ALGP 21

Aim

Improvement of LM269D, DA10D and DA115D recombination with La Mé

Characteristics

- November 1998 – Aek Loba – Blocks 620A and 621B – Second generation of oil palm
- Second cycle progeny trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 10 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002)

Results summary

Top 3:

(15) PO2799D*PO4743P a
(16) PO2818D*PO4743P b
(17) PO2972T*PO3224D bc

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	7.541	8.613
FFB	28.371	30.775
OER	26.4	27.8
PKOR	1.8	1.5

At 3 – 5 yrs old

	Mean	Top 3
CPO	5.395	5.812
FFB	20.434	20.907

Habit of PO4743P offspring is not corresponding to this of other (LM2T * SI10T) parents. Top 3 gross revenue with USD 4586.2, exceeding the mean by 12.6% is the best in 1998 plantings. 40 % of Top 3 progress comes from OER.

ALGP 22

Aim

Test of various clones coming from Aek Kwasan genetic block.

Characteristics

- November 1998 – Aek Loba – Block 622B – Second generation of oil palm
- Clone test
- Fisher blocks, 17 treatments, 6 replicates
- Assisted pollination from 3 to 6 yrs old

Realized observation

Individual recording (3 – 10 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem height (6 and 9 yrs old)
Canopy at 9 yrs old
Leaf area at 10 yrs old
Leaf analysis per progeny (2001, 2003, 2005, 2007)
Male flowering since 2002)

Results summary

Top 3:

(07) SOC3604 (LM3954T*LM2361D)[15] ab
(10) SOC3607 (LM3954T*LM2361D)[11] a
(14) SOC3208 (LM2781D*LM2256P)[16] a

At 6 - 9 yrs old

	Mean	Top 3
Palm oil	6.659	7.549
FFB	25.840	29.405
OER	25.52	25.8
PKOR	1.64	1.7

At 3 – 5 yrs old

	Mean	Top 3
CPO	4.230	4.092
FFB	16.576	15.808

This clone test is the worst performer from all Aek Loba Timur trials (sexual + clone merged). OER is disappointing. Top 3 clones reach USD 4066.6 as gross revenue only below ALGP 11 Top 3.

[15] DA5D selfed * LM5T selfed
[16] (DA10D*DA3D) * LM2T selfed

ALGP 23

Aim

Improvement of (BB126D * BB150D), BB177D * BB129D) or BB206D selfed by Nifor or Yangambi

Characteristics

- February 1999 – Aek Loba – Blocks 514B – Second generation of oil palm
- Second cycle progeny trial
- 4 * 4 balanced lattice, 16 treatments, 5 replicates
- Assisted pollination from 3 to 5 yrs old

Realized observation

Individual recording (3 – 9 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem growth (6 and 9 yrs old)
Leaf analysis per progeny (2002, 2004, 2006, 2008)
Male flowering since 2002

Results summary

Top 3:

(01) BB3987D*BB94T[17] ab
(02) BB2150D*BB270P[18] a
(08) BB5210T*BB3980D[19] a

At 6 – 8 yrs old

	Mean	Top 3
Palm oil	6.958	7.967
FFB	26.961	30.918
OER	25.7	25.8
PKOR	1.8	1.8

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	6.276	6.534
FFB	24.431	25.376

This material appears good starter. But, OER is really disappointing. Top 3 improvement comes only from FFB. Top 3 gross revenue reaches USD 4305.1 at 6 – 8 yrs old.

[17] (BB126D*BB150D)*(PO1879T*PO1876T)
[18] (BB126D*BB150D)*LM2T Selfed
[19] (BB177D*BB129D)*(PO1879T*PO1876T)

ALGP 24

Aim

Second cycle of Deli * Angola improvement with La Mé

Characteristics

- March 1999 – Aek Loba – Block 513A/C – Second generation of oil palm
- Second cycle trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 5 yrs old

Realized observation

Individual recording (3 – 9 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem growth (6 and 9 yrs old)
Leaf analysis per progeny (2002, 2004, 2006, 2008)
Male flowering since 2002

Results summary

Top 3[20]:

(10) BB5500D*BB5444T c
(19) BB5508D*BB5450T c
(20) BB5447T*BB5511D b

At 6 – 8 yrs old

	Mean	Top 3
Palm oil	7.404	7.802
FFB	31.266	32.796
OER	23.5	23.8
PKOR	2.3	2.9

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.852	6.260
FFB	24.818	26.259

Because the way of the crosses (dura La Mé * T/P (deli*Angola), the kernel is very big, inducing a poor extraction rate. Balance between bunch number and ABW is in bunch number favor. Regular bad fruit set cycles due to poor male flowering are recorded.

[20] Concerns (Deli * Angola) * LA ME only

ALGP 25

Aim

Second cycle of Deli * Angola improvement with La Mé

Characteristics

- March 1999 – Aek Loba – Block B/D – Second generation of oil palm
- Second cycle trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 5 yrs old

Realized observation

Individual recording (3 – 9 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Stem growth (6 and 9 yrs old)
Leaf analysis per progeny (2002, 2004, 2006, 2008)
Male flowering since 2002

Results summary[21]

Top 3[16]:

(09) BB5503D*BB5453P abc
(10) BB5505D*BB5454P bcd
(17) BB5451T*BB5509D cde

At 6 – 9 yrs old

	Mean[16]	Top 3
Palm oil	7.046	7.614
FFB	30.541	30.836
OER	23.0	24.6
PKOR	2.7	2.7

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.638	6.032
FFB	24.503	24.520

[21] See the comments for ALGP24

ALGP 26

Aim

Improvement of DA3D, DA5D, DA10D and DA115D recombination by La Mé

Characteristics

- April 2000 – Aek Loba – Block 515A/C – Second generation of oil palm
- Second cycle trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 5 yrs old

Realized observation

Individual recording (3 – 8 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Leaf analysis per progeny (2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(08) PO2534D*PO4982P[22] a
(09) PO2630D*PO2766P[23] b
(24) PO4857D*PO4693P[24] b

At 5 – 7 yrs old

	Mean	Top 3
Palm oil	7.297	8.195
FFB	28.438	29.749
OER	25.6	27.4
PKOR	1.7	1.5

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.742	6.096
FFB	22.449	22.239

Top 3 produces 12.3 % more than trial mean. 60% of improvement comes from OER. Top 3 gross revenue rises USD 4366.8 / ha, that is to say USD 263 and USD 550 more than DA115D * LM2T and DA10D * LM2T respectively.

[22] (DA10D*DA3D) * (LM5T*LM10T)
[23] (DA10D*DA3D) * LM10T selfed
[24] LM3257D selfed * LM2T II

ALGP 27

Aim

Improvement of DA115D selfed by La Mé

Characteristics

- May 2000 – Aek Loba – Block 515B/D – Second generation of oil palm
- Second cycle trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 5 yrs old

Realized observation

Individual recording (3 – 8 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Leaf analysis per progeny (2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(04) PO2630D*PO4963T bc
(07) PO6619D*PO4974T a
(12) PO5061D*PO4693P b

At 5 – 7 yrs old

	Mean	Top 3
Palm oil	7.264	8.144
FFB	28.223	29.615
OER	25.5	27.2
PKOR	1.9	1.5

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.750	6.305
FFB	22.559	23.156

Top 3 produces 12.1 % more than trial mean. 60% of improvement comes from OER. Top 3 gross revenue rises USD 4343 / ha, that is to say USD 412 and USD 662 more than DA115D * LM2T and DA10D * LM2T respectively

ALGP 28

Aim

Improvement of DA10D, DA115D, DA128D, DA300D, LM404D recombination by La Mé

Characteristics

- May 2000 – Aek Loba – Block 623A/B – Second generation of oil palm
- Second cycle trial
- 5 * 5 balanced lattice, 25 treatments, 6 replicates
- Assisted pollination from 3 to 5 yrs old

Realized observation

Individual recording (3 – 8 yrs old)
Bunch analysis (5 – 7 yrs old)
Individual census (since planting)
Leaf analysis per progeny (2003, 2005, 2007)
Male flowering since 2002

Results summary

Top 3:

(12) PO3052D*PO4982P a
(21) PO3600T*PO4799P ab
(22) PO3600D*PO3243P ab

At 5 – 7 yrs old

	Mean	Top 3
Palm oil	7.068	7.791
FFB	26.183	26.888
OER	26.7	28.9
PKOR	1.7	1.7

At 3 – 5 yrs old

	Mean	Top 3
Palm oil	5.163	5.808
FFB	19.307	20.125

Top 3 produces 10.2 % more than trial mean. 60% of improvement comes from OER with Top 3 total extraction rate exceeding 30%. Top 3 gross revenue rises USD 4173 / ha, that is to say USD 316 and USD 616 more than DA115D * LM2T and DA10D * LM2T respectively. Lower performance is due to successive drought in 2000 and 2005.